

# Pregnancy with diaphragmatic and stomach rupture: Lessons from a case report

Reza Alizadeh<sup>1</sup>  | Ziba Aghsaeifard<sup>2,3</sup>  | Zahra Marzban-rad<sup>4</sup>  |  
Saied Marzban-rad<sup>4</sup> 

<sup>1</sup>Department of Anesthesiology and Intensive Care, Faculty of Medicine, AJA University of Medical Sciences, Tehran, Iran

<sup>2</sup>Department of Internal Medicine, School of Medicine, Sina Hospital, Tehran University of Medical Sciences, Tehran, Iran

<sup>3</sup>Urology Research Center, Tehran University of Medical Sciences, Tehran, Iran

<sup>4</sup>Department of Surgery, Faculty of Medicine, AJA University of Medical Sciences, Tehran, Iran

## Correspondence

Saied Marzbanrad, AJA University of Medical Sciences, Tehran, Iran.  
Email: md.saiedmarzbanrad@gmail.com

## Abstract

This report presents a case of diaphragmatic and stomach rupture in a 30-week pregnant woman. Timely diagnosis and management of the rupture is important to reduce systemic complications and effects on the mother and fetus. Symptoms and signs should be clearly studied to prevent misdiagnosis and delay in the treatment.

## KEYWORDS

blunt trauma, diaphragmatic, misdiagnosis, perforation, pregnant woman, rupture

## 1 | INTRODUCTION

Thoracoabdominal trauma is significantly associated with diaphragmatic rupture. This can be asymptomatic without any significant findings from the imaging for a long time. Furthermore, these may also develop with a delay, following the trauma. Stomach and intestine complications might be the result of post-trauma diaphragm rupture.<sup>1</sup> These patients may also develop chronic thoracoabdominal symptoms or acute abdominal complications.<sup>2</sup> A simultaneous occurrence of diaphragmatic and stomach rupture is rare during pregnancy and might lead to mortality. It is mostly reported in third trimester and is characterized with a significantly high number of mortalities. Stomach rupture can be caused by excessive intake of fluids, supplemental oxygen via nasal cannula or pyloric obstruction.<sup>3</sup>

## 2 | CASE PRESENTATION

A 36-year-old woman with recurrent nausea and vomiting, diarrhea, and epigastric pain extending to her left shoulder, which was worsening with the breathing, was admitted to the Emergency Department of Shahid Chamran Hospital in Tehran, Iran. She reported a history of a car accident 12 weeks before the referral. In the examination, she had a normal abdomen and reduced respiratory sounds on the left side.

Ultrasonography for the pregnancy was normal, and the routine test results were reported as follows:

BP: 90/60, Amylase: 60, cr: 0.7, RR: 25, N: 136, SGOT: 13, K: 4.1, WBC: 12.6, Hb: 12.8, P: 85, SGPT: 12, blood sugar: 94.

ECG and cardiac enzymes were normal too (Troponin: 0.1, CPK and CK-MB: Normal).

The patient was diagnosed with gastroenteritis, and due to D-dimer: 1917 (<442), she was admitted due to the suspicion of pulmonary embolism. Based on the emergency findings of penguin thorax, the chest tube was placed. By evacuating about 3 liters of biliary fluid, the patient's condition and vital signs returned to the normal.

Thoracotomy of the patient revealed diaphragmatic rupture and stomach hernia to the left hemidiaphragm and rupture of the stomach. Following were the laboratory findings: T: 37, PR: 100, WBC: 20, Neutrophils: % 82, Lymphocytes: % 11, Hb: 13.3, PLT: 223.

Left-handed thoracotomy from the sixth intercostal space was performed using a 35-gauge double-lumen tube, and in the left lateral position, with the preservation of the Saratous muscle, the chest wall was opened. In the initial exploration, there was a large stomach curvature rupture, after which stomach catheter was placed and the perforation was restored in two layers.

After inserting the stomach into the peritoneal cavity, the diaphragm repair in the first layer was restored as "MAY" with polypropylene No. 1, separately followed by the repair of the second surface layer using polypropylene as "Continue."

To it, chest tube drainage system was maintained to prevent empyema.

Fetal examination showed normal movements, and the vital signs were as follows:

PR: 122, T: 37, BP: 120/78. Following 2 days after the surgery, the patient's vitals were as follows: Sat O<sub>2</sub>: 99%, PR: 60, T: 37.5, BP: 120/70. She was provided with fluid therapy.

Six days later, the chest tube was removed, and the patient was declared to be in a good general condition, with the preservation of the fetus and continued pregnancy. Due to the Breech position of the fetus, after 2 weeks, delivery was performed with cesarean section, and both were discharged with the good general condition (WBC: 9.8, Neutrophils: 70.2%, Lymphocytes: 16.3%, Hb: 11) (Table 1).

### 3 | DISCUSSION

Our case report is one the fewest reported case of concurrence of diaphragmatic and stomach rupture during the pregnancy. It can lead to respiratory problems, intestinal rupture, and death.<sup>3</sup> Gastric perforation can be characterized by increased

**TABLE 1** A summary of the diagnosis steps up to the patient's treatment

Stage of the laboratory finding	Normal values	Patient's values
At the time of the admission	Temperature (T): 37°C BP: 120/80 mm Hg Amylase: 0-130 units/L C-reactive protein (cr): 0.0-0.8 mg/dL Respiratory rate (RR): 12-20 breaths/min Aminotransferase, aspartate (AST or SGOT): 0-35 units/L Aminotransferase, alanine (ALT or SGPT): 0-35 units/L Potassium (K): 3.5-5.0 meq/L White blood cells (WBCs): 4.0-10 × 10 <sup>9</sup> /L Hemoglobin (Hb): Female 12-16 g/dL Platelet count (PLT): 150 000-350 000/μL Blood sugar: (random) 160-200 mg/dL Phosphorous (P): 3-4.5 mg/dL	BP: 90/60, Amylase: 60 Cr: 0.7 RR: 25 N: 136 SGOT: 13 K: 4.1 WBC: 12.6 Hb: 12.8 P: 85 SGPT: 12 Blood sugar: 94 Troponin: 0.1 D-dimer: 1917 CPK and CK-MB: Normal
Before the surgery	Troponin I: 0-0.5 ng/mL D-Dimer: <0.5 μg/mL (0.5 mg/L) Oxygen saturation (Sat O <sub>2</sub> ): 95% or greater	T: 37 PR: 100 WBC: 20 Neutrophils: % 82 Lymphocytes: % 11 Hb: 13.3 PLT: 223
After the surgery		Sat O <sub>2</sub> : 99% PR: 60 T: 37.5 BP: 120/70
Before discharge		WBC: 9.8, Neutrophils: 70.2% Lymphocytes: 16.3% Hb: 11

epigastric pain (initially localized and later generalizes) and may lead to syncope, cardiovascular collapse. Treatment delay >12 hours can increase the odds of fatality.<sup>4</sup> Stomach is protected by liver and ribs, that protects it from the rupture. However, increased abdominal pressure, uterine size, and vomiting during the pregnancy, and diaphragmatic eventration can lead to the rupture.<sup>5,6</sup> Nonetheless, patient had a history of trauma that might have led to late-onset diaphragmatic and gastric rupture. If not managed on time, it can lead to maternal and fetal morbidity and mortality.<sup>7</sup> Morcillo-López et al<sup>3</sup> presented a case of a pregnant woman presented with diaphragmatic and gastric rupture that was presented with chest pain and hypoventilation.

Most of the diaphragmatic herniation is reported on the left side due to an injury to phrenic nerve<sup>8</sup> as a result of the trauma, which is similar to our study and the above-mentioned case, whereas lesser curvature of the stomach is more prone to the rupture due to reduced elasticity.<sup>5</sup> Early diagnosis and repair surgery can reduce the mortality and complication.<sup>6</sup> Symptomatic rupture is associated with a greater rate of maternal and fetal mortality 60%-85%, and therefore, immediate measures should be taken. Owing to increased abdominal pressure, vaginal delivery is not recommended.

## 4 | CONCLUSION

Pregnant woman with symptomatic diaphragmatic and stomach ruptured are considered as high-risk patients and repair measure should be taken instantly. Additionally, diagnosis of diaphragmatic problems in early pregnancy can lead to better maternal and fetal outcomes.

## CONFLICT OF INTEREST

The authors deny any conflict of interest in any terms or by any means during the study. All the fees provided by research center fund and deployed accordingly.

## AUTHOR CONTRIBUTIONS

RA and ZA: conceptualized and designed the study, drafted the initial manuscript, and reviewed and revised the manuscript. SM: designed the data collection instruments, collected data, carried out the initial analyses, and reviewed and revised the manuscript. ZM: coordinated and supervised data


collection, and critically reviewed the manuscript for important intellectual content.

## ORCID


Reza Alizadeh  <https://orcid.org/0000-0003-3469-0735>

Ziba Aghsaeifard  <https://orcid.org/0000-0001-5095-1654>

[org/0000-0001-5095-1654](https://orcid.org/0000-0001-5095-1654)

Zahra Marzban-rad  <https://orcid.org/0000-0002-1516-7976>

[org/0000-0002-1516-7976](https://orcid.org/0000-0002-1516-7976)

Saied Marzban-rad  <https://orcid.org/0000-0003-3068-2463>

[org/0000-0003-3068-2463](https://orcid.org/0000-0003-3068-2463)

## REFERENCES

1. Wani NA, Kosar TL, Ahmad A, Yusuf M. Traumatic diaphragmatic rupture with delayed gastric incarceration. *J Emerg Trauma Shock*. 2010;3(3):306.
2. Dwari AK, Mandal A, Das SK, Sarkar S. Delayed presentation of traumatic diaphragmatic rupture with herniation of the left kidney and bowel loops. *Case Rep Pulmonol* 2013;2013:814632.
3. Morcillo-López I, Hidalgo-Mora JJ, Baamonde A, Díaz-García C. Gastric and diaphragmatic rupture in early pregnancy. *Interact Cardiovasc Thorac Surg*. 2010;11(5):713-715.
4. Ntirushwa D, Rulisa S, Muhorakeye F, Bazzett-Matabele L, Rurangwa T, Small M. Gastric rupture in pregnancy: case series from a tertiary institution in Rwanda and review of the literature. *Am J Perinatol Rep*. 2016;6(04):e436-e441.
5. Cha AS, Krew MA, Tamlyn T, Gill P. Gastric rupture associated with pregnancy. *Obstet Gynecol*. 2002;100(5):1072-1074.
6. Luu TD, Reddy VS, Miller DL, Force SD. Gastric rupture associated with diaphragmatic hernia during pregnancy. *Ann Thorac Surg*. 2006;82(5):1908-1910.
7. Policiano C, Rocha P, Catanho MC, Pinto L, Valentim-Loureiro A, Graça LM. Acute fetal asphyxia after gastric rupture in a pregnant patient with a gastric band. *Acta Obstet Gynecol Scand*. 2013;92(12):1419-1421.
8. Mitchell T, Ridley P, Forrester-Wood C. Spontaneous rupture of a congenital diaphragmatic eventration. *Eur J Cardiothorac Surg*. 1994;8(5):281-282.

**How to cite this article:** Alizadeh R, Aghsaeifard Z, Marzban-rad Z, Marzban-rad S. Pregnancy with diaphragmatic and stomach rupture: Lessons from a case-report. *Clin Case Rep*. 2020;8:1206–1208. <https://doi.org/10.1002/ccr3.2878>